AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-16. (cancelled).

17. (currently amended) A method of forming an imide hydrogen storage material represented by the formula, $M^{c}(NH)^{-2}{}_{c/2}$, comprising: reacting an amide $MI^{d}(NH_2)_d{}^{-1}$ with a hydride $MII^{f}H_f$ to form the imide hydrogen storage material that reversibly stores hydrogen; where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, MI and MII represent cationic species other than hydrogen; and c, d, and f respectively represent average valence states of respectively said M, MI and MIII.

18. (original) The method of Claim 17 where the amide is lithium amide, the hydride is lithium hydride, and the imide is lithium imide.

19. (currently amended) The method of Claim 17 wherein at least two of M, MI and MII are distinct cationic species ~~are each independently selected~~.

20. (currently amended) A method of making an imide hydrogen storage material represented by $M^{c}(NH)^{-2}{}_{c/2}$, comprising: reacting a nitride represented by the formula $MIII^{g}N_{3/g}$ with an amide represented by $MI^{d}(NH_2)_d{}^{-1}$, where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, MI and MIII represent

cationic species other than hydrogen, and c, d and g represent average valence states of respectively said M, MI and MIII.

21. (currently amended) A method for forming a reversible [[an]] imide hydrogen storage material represented by $M^{c}(NH)^{-2}_{c/2,}$ comprising: heating an amide compound represented by $MI^{d}(NH_2)_{d}^{-1}$ for a time and at a temperature sufficient to produce reaction product comprising said reversible imide hydrogen storage material and ammonia (NH_3); and separating at least a portion of said ammonia from said reaction product to provide said imide material; where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, and MI represent cationic species other than hydrogen, and where c and d represent average valence states of respectively M and MI.

22. (currently amended) A hydrogen storage composition having an initial hydrogenated state and a subsequent dehydrogenated state:

(a) in said initial hydrogenated state, said composition comprises an amide and a hydride; and

(b) in said subsequent dehydrogenated state, said composition comprises an imide represented by $M^{c}(NH)^{-2}_{c/2}$, where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, and c represents an average valence state of M, where said imide is regenerated to said initial hydrogenated state by exposure to hydrogen.

23. (original) The composition of Claim 22 wherein said imide is represented by the formula Li_2NH.

24. (original) The composition of Claim 22 wherein said amide is represented by the formula $LiNH_2$.

25. (original) The method of Claim 22 wherein said hydride is represented by the formula LiH.

26. (withdrawn) A method of producing a source of hydrogen gas comprising: liberating hydrogen from a hydrogenated composition comprising an amide and a hydride by heating said composition at an elevated temperature sufficient to evolve hydrogen gas therefrom thereby producing dehydrogenated product; and then regenerating said hydrogenated composition by exposing said dehydrogenated product to hydrogen gas.

27. (withdrawn) The method of Claim 26 wherein said dehydrogenated product comprises imide.

28. (withdrawn) The method of Claim 26 wherein said liberating of hydrogen is conducted at an elevated temperature greater than about 125°C.

29. (withdrawn) The method of Claim 26 wherein said liberating of hydrogen is conducted at an elevated temperature greater than about 150°C.

30. (withdrawn) The method of Claim 26 wherein said regenerating is conducted at an elevated pressure.

31. (withdrawn) The method of Claim 26 wherein said regenerating is conducted at an elevated pressure greater than about 10 kPa.

32. (withdrawn) The method of Claim 26 wherein said regenerating is conducted at an elevated pressure greater than about 200 kPa.

33. (currently amended) A method of cycling hydrogen comprising: mixing together at least two distinct hydrogen-containing compounds in particle form and heating said particles to release hydrogen and form an imide represented by $M^c(NH)^{-2}_{c/2}$, where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, and c represents an average valence state of M; and then storing hydrogen by reacting hydrogen with said imide to form at least one of said two distinct hydrogen-containing compounds.

34. (previously presented) The method of Claim 33 wherein said at least two distinct compounds comprise an amide and a hydride.

35. (cancelled).

36. (currently amended) The method of Claim 33 wherein said at least two distinct compounds comprise a first compound represented by $MI^{d}(NH_2)_d^{-1}$ (amide) and a second compound represented by $MII^{f}H_f$ (hydride), where MI and MII respectively represent cationic species or a mixture of cationic species other than hydrogen, and d represents an average valence state of MI and f represents an average valence state MII.

37. (previously presented) The method of Claim 33 wherein said imide is lithium imide represented by Li_2NH and said distinct compounds comprise a first compound represented by $LiNH_2$, and a second compound represented by LiH.

38. (currently amended) The method of Claim 35 wherein M comprises an element selected from the group consisting of ~~Ba, Ca, Eu, La,~~ Li, Mg, Na, Be, ~~Sr, Th~~ and mixtures thereof.

39. (previously presented) The method of Claim 34 wherein said imide is represented by the formula MgNH, said amide is represented by the formula $Mg(NH_2)_2$ and said hydride is represented by the formula MgH_2.

40. (currently amended) The method of Claim 36 wherein at least two of said M, MI and MII are distinct cationic species ~~are each elements independently selected~~.

41. (currently amended) The method of Claim 40 wherein at least one of said ~~M,~~ MI and MII ~~are each elements~~ comprises said cationic species selected as M and further MI and MII optionally comprise an additional element independently selected from the group consisting of CH_3, Al, As, B, Ba, Be, Ca, Cd, Ce, Cs, Cu, Eu, Fe, Ga, Gd, Ge, Hf, Hg, In, K, La, Li, Mg, Mn, Na, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Se, Si, Sm, Sn, Sr, Th, Ti, Tl, W, Y, Yb, Zn, Zr, and mixtures thereof.

42. (currently amended) The method of Claim 40 wherein at least one of said ~~M,~~ MI and MII ~~are each elements~~ comprises said cationic species selected as M and further MI and MII optionally comprise an additional element independently selected from the group consisting of Ba, Be, Ca, Cs, Eu, In, K, La, Li, Mg, Na, Ni, Rb, Sm, Sr, Yb, and mixtures thereof.

43. (currently amended) The method of Claim 40 wherein at least one of said ~~M,~~ MI and MII ~~are each elements~~ comprises said cationic species selected as M and further MI and MII optionally comprise an additional element independently selected from the group consisting of Ba, Ca, Eu, La, Li, Mg, Si, Sr, Th, Ti, Zr, and mixtures thereof.

44. (currently amended) The method of Claim 40 wherein at least one of said ~~M,~~ MI and MII ~~are each elements~~ comprises said cationic species selected as M and

further MI and MII optionally comprise an additional element independently selected from the group consisting of Ba, Ca, Si, Sr, Th, Ti, Zr, and mixtures thereof.

45. (currently amended) The method of Claim 40 wherein at least one of said ~~M,~~ MI and MII ~~are each elements~~ comprises said cationic species selected as M and further MI and MII optionally comprise an additional element independently selected from the group consisting of Al, Ba, Be, Ca, Ce, Cs, Eu, Ga, Gd, In, K, La, Li, Mg, Mn, Na, Nd, Pb, Rb, Si, Sm, Sn, Sr, Y, Yb, Zn, and mixtures thereof.

46. (currently amended) The method of Claim 40 wherein M, MI and MII are each elements independently selected from the group consisting of ~~Al,~~ Be, ~~B,~~ Mg, Li, Na, and mixtures thereof.

47. (previously presented) The method of Claim 33 wherein said particles are mixed together by milling.

48. (currently amended) A hydrogen storage system having a hydrogenated state and a dehydrogenated state:

(a) said hydrogenated state comprises a first group of particles containing an amide and a second group of particles containing a hydride; and

(b) said dehydrogenated state comprises an imide represented by $M^c(NH)^{-2}_{c/2}$, where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, and c

represents an average valence state of M, that is regenerated to said hydrogenated state by exposure to hydrogen.

49. (previously presented) The system of Claim 48 wherein said hydrogenated state is a first condition, said dehydrogenated state is a second condition and wherein a third condition is a hydrogenated state comprising at least one of an amide and a hydride.

50. (currently amended) A source of hydrogen comprising an imide represented by $M^c(NH)^{-2}_{c/2}$, where M represents a cationic species of at least one of: Li, Mg, Na, B, Al, Be, Zn, and c represents an average valence state of M, said imide being formed by reacting particles containing amide and particles containing hydride.

51. (previously presented) The source of Claim 50 where the amide is lithium amide and the hydride is lithium hydride.